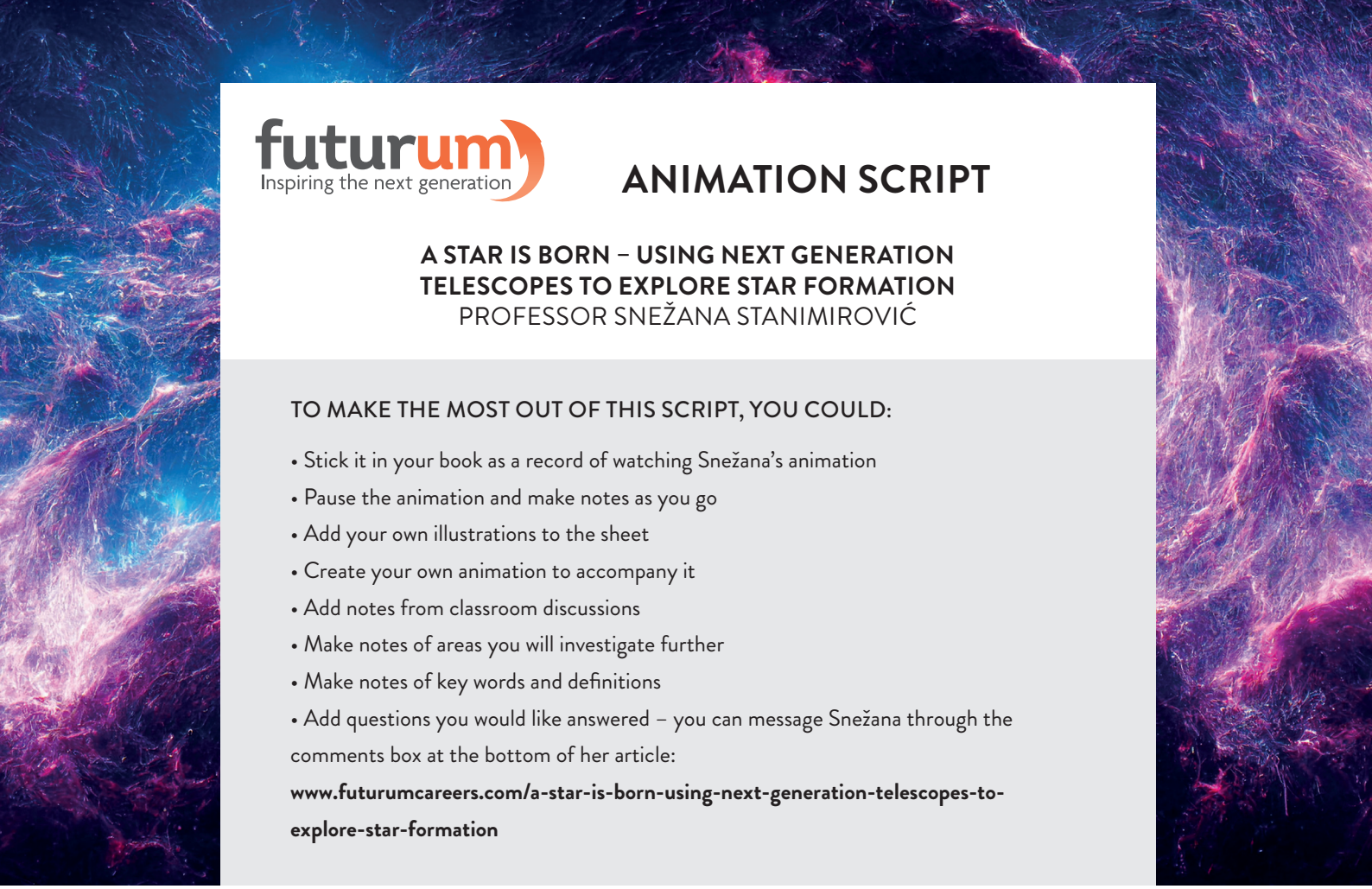

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ANIMATION SCRIPT

A STAR IS BORN – USING NEXT GENERATION TELESCOPES TO EXPLORE STAR FORMATION

PROFESSOR SNEŽANA STANIMIROVIĆ

TO MAKE THE MOST OUT OF THIS SCRIPT, YOU COULD:

- Stick it in your book as a record of watching Snežana's animation
- Pause the animation and make notes as you go
- Add your own illustrations to the sheet
- Create your own animation to accompany it
- Add notes from classroom discussions
- Make notes of areas you will investigate further
- Make notes of key words and definitions
- Add questions you would like answered – you can message Snežana through the comments box at the bottom of her article: **www.futurumcareers.com/a-star-is-born-using-next-generation-telescopes-to-explore-star-formation**

SCRIPT:

Our sun is one of roughly 100 billion stars in the Milky Way. It formed around 4.5 billion years ago when a giant cloud of gas and dust collapsed in on itself under the force of its own gravity. Although this is how all stars form, there is still a lot we do not know about the process.

Professor Snežana Stanimirović, an astrophysicist from the University of Wisconsin-Madison in the US, is working with two research surveys to learn more.

The Galactic Australian Square Kilometre Array Pathfinder (GASKAP) survey uses a giant synthesis array in Australia. A synthesis array is a collection of radio antennae that work together to act as one huge telescope.

The ASKAP telescope consists of 36 antennae spread out over 6km2. Each antenna is equipped with a phased array feed made of 188 receiver elements that detect radio waves emitted from stars or galaxies.

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Phase array feed is brand-new technology and provides a significant upgrade on traditional radio telescopes. As a result, the ASKAP telescope can capture images of a much higher quality and will allow Snežana to study important physical processes for the first time.

Researchers have been working on pilot studies, testing observation and data processing strategies and, so far, have surveyed two of our closest galactic neighbours, the Small and Large Magellanic Clouds.

Snežana and her colleagues are now preparing to survey a large area of the Milky Way, as well as the Magellanic Stream, a long tail of gas extending from the Magellanic Cloud galaxies, formed by interactions between them and the Milky Way.

The second survey Snežana is working on is the Local Group L-Band Survey (LGLBS), using the Karl G. Jansky Very Large Array (VLA) telescope in New Mexico, in the US.

LGLBS is taking observations of the Andromeda and Triangulum galaxies, as well as four dwarf galaxies. Besides the Magellanic Clouds, these are the only star-forming galaxies that current radio telescopes can observe in high-resolution.

The images produced by LGLBS will allow Snežana to glimpse the conditions that eventually lead to the formation of new stars. She will be exploring how atomic gas is distributed within galaxies, and how star-forming clouds of gas accumulate from interstellar atomic gas.

LGLBS will also study radio wave emissions from these galaxies and observe how interstellar gas moves around and interacts with its surroundings.

ANIMATION SCRIPT

The GASKAP and LGLBS surveys involve huge amounts of observation time and will produce about a million gigabytes of data. Collecting and processing such data requires a lot of work, the use of very powerful supercomputers and collaboration between scientists from around the world.

For Snežana and her fellow researchers, there is a lot of fascinating work still to come!

What could you achieve as an astrophysicist?